Factors Influencing Wound Healing of Critical Ischaemic Foot after Bypass Surgery: Is the Angiosome Important in Selecting Bypass Target Artery?

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Objectives: The aim of the study is to determine factors affecting ischaemic wound healing and role of the angiosome concept in bypass surgery.

Design: Single-centre, retrospective clinical study.

Materials and methods: A total of 249 consecutive critical ischaemic limbs with tissue loss in 228 patients who underwent distal bypasses from 2003 to 2009 were reviewed. A total of 81% of patients were diabetic, and 49% of patients had dialysis-dependent renal disease (end-stage renal disease, ESRD). Distal targets of bypasses were the crural artery (57%) and the pedal artery (43%).

Results: The complete healing of ischaemic wounds was achieved in 211 limbs (84.7%). ESRD (odds ratio (OR) 0.127, $p < 0.001$), diabetes (OR 0.216, $p = 0.030$), Rutherford category 6 (R6) with heel ulcer/gangrene (OR 0.134, $p < 0.001$), R6 except heel (OR 0.336, $p = 0.025$) and low albuminaemia (OR 0.387, $p = 0.049$) were negative predictors of wound healing. Regarding the angiosome, the healing rate in the indirect revascularisation (IR) group was slower than in the direct revascularisation (DR) group, especially in patients with ESRD ($p < 0.001$). However, the healing rates of the DR and IR groups were similar after minimising background differences with propensity score methods ($p = 0.185$).

Conclusions: In the field of bypass surgery, the angiosome concept seems unimportant, at least in non-ESRD cases. The location and extent of ischaemic wounds as well as co-morbidities may be more relevant than the angiosome in terms of wound healing.